UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/779,717	02/18/2004	Tsuyoshi Torii	FU020004-US	1730

21254 7590 04/13/2006	EXAMINER	
MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC	COUGHLAN, PETER D	
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SUITE 200	ART UNIT	PAPER NUMBER
VIENNA, VA 22182-3817	2129	

DATE MAILED: 04/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/779,717	TORII ET AL.
	Examiner	Art Unit	
	Peter Coughlan	2129	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 February 2004*.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 February 0204* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☒ All   b)☐ Some * c)☐ None of:

   1.☒ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/19/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

1.   Claims 1-19 are pending in this application.

35 USC § 101

2.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine,
> manufacture, or composition of matter, or any new and useful improvement
> thereof, may obtain a patent therefor, subject to the conditions and requirements
> of this title.

Claims 1-19 are rejected under 35 U.S.C. 101 for nonstatutory subject matter.

The computer system must set forth a practical application of that § 101 judicial

exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-

77. The invention is ineligible because it is for a 'vehicle motion model'. 'Vehicle motion

model' is neither useful nor tangible. What use does a 'vehicle motion model' have? It

is abstract as well and existing as numbers as a result of a computation.

In determining whether the claim is for a "practical application," the focus is not

on whether the steps taken to achieve a particular result are useful, tangible and

concrete, but rather that the final result achieved by the claimed invention is "useful,

tangible and concrete." If the claim is directed to a practical application of the § 101

judicial exception producing a result tied to the physical world that does not preempt the

judicial exception, then the claim meets the statutory requirement of 35 U.S.C. § 101.

The phrase 'vehicle motion model', is not clear in its purpose or scope. The invention seems to generate numbers for 'yaw rate', 'lateral G', 'roll' and 'pitch'. But these are only numbers with no real world purpose.

The invention must be for a practical application and either:

1) specify transforming (physical thing) or

2) have the FINAL RESULT (not the steps) achieve or produce a

   useful (specific, substantial, AND credible),

   concrete (substantially repeatable/ non-unpredictable), AND

   tangible (real world/ non-abstract) result.

A claim that is so broad that it reads on both statutory and non-statutory subject matter, must be amended, and if the specification discloses a practical application but the claim is broader than the disclosure such that it does not require the practical application, then the claim must be amended.

Claims that recites a connected neural networks that only calculates values is not statutory.

Claim Rejections - 35 USC § 112

3.   Claims 13-19 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it

pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 13 through 19 state the use of a recurrent neural network based on genetic

algorithm to adjust the weights. This is beyond the scope of one ordinary skilled in the

art. Genetic algorithms start off with a random number for an initial starting point.

There is also a status at time 'X' in which changes are made to the chromosome at time

'X + 1'. There is no mention by the applicant on how this is accomplished. There is no

mention on the connections between the recurrent neural network and the genetic

algorithm and what process happens at what location during time 'T'. This is a very

convoluted design that must be clearly explained.

4.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out
> and distinctly claiming the subject matter which the applicant regards as his
> invention.

Claim 16 recites the limitation "second recurrent neural network" in claim 13.

There is insufficient antecedent basis for this limitation in the claim.

Claim 17 recites the limitation " second recurrent neural network " in claim 14

which is dependent to claim 13. There is insufficient antecedent basis for this limitation

in the claim.

Claim 18 recites the limitation " second recurrent neural network " in claim 15

which is dependent to claim 13. There is insufficient antecedent basis for this limitation

in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form
the basis for the rejections under this section made in this Office action:
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public
use or on sale in this country, more than one year prior to the date of application for patent in the United
States.

Claims 13-18 are rejected under 35 U.S.C. 102(b) (hereinafter referred to as

Kamihira) being anticipated by Kamihira et al., U.S. Patent Publication 20020045958.

Claim 13.

Kamihira anticipates determining an optimum solution of a genetic type based on

a learning rule using a hereditary algorithm while setting said coupling weight coefficient

in said first recurrent neural network as said genetic type (**Kamihira,** ¶0053 and ¶0074);

and outputting an optimum solution of said coupling weight coefficient to said first

recurrent neural network based on said optimum solution of said genetic type, wherein

(**Kamihira,** ¶0049, ¶0041, ¶0053 and ¶0074) said first recurrent neural network outputs

a parameter indicating said motion state of the vehicle based on predetermined input

information, thereby functioning as said vehicle motion model. (**Kamihira,** ¶0038;

'Vehicle motion' of applicant is equivalent to 'controlling a vehicle engine' of Kamihira.)

Claim 14.

Kamihira anticipates the step of determining said optimum solution of said

genetic type while connection of respective nodes between neighboring layers is set as

a processing target. (**Kamihira,** ¶0041; "Optimum solution' of applicant is equivalent to

'customizes control parameters' of Kamihira.)

Claim 15.

Kamihira anticipates determining said optimum solution of said coupling weight

coefficient while mutual connection of respective nodes is set as a processing target.

(**Kamihira,** ¶0040 and ¶0041; 'Optimum solution' and 'coupling weight coefficient' of

applicant is equivalent to 'optimum control' and 'control parameters' of Kamihira.)

Claims 16, 17 and 18.

Kamihira anticipates determining the optimum solution of the genetic type while

setting the coupling weight coefficient in said second recurrent neural network as said

genetic type, and outputting said optimum solution of said coupling weight coefficient to

said second recurrent neural network based on said optimum solution of said genetic

type. (**Kamihira,** ¶0049 and ¶0041; "Determining the optimum solution' of applicant is

equivalent to 'optimal process' of Kamihira.)

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed
> or described as set forth in section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was
> made.

Claims 1, 2, 3, 5, 7, 9, 11 and 12 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Kamihira as set forth above in view of Mehrotra ('Elements of

Artificial Neural Networks', referred to as **Mehrotra**)

Claims 1, 11 and 12.

Kamihira fails to particularly call for a first recurrent neural network formed by

connecting plural nodes so that an output of a node is input to another node in

accordance with a predetermined coupling weight coefficient, comprising a loop feeding

back an output of at least one node to at least one of said one node and a node other

than said one node.

Mehrotra teaches a first recurrent neural network formed by connecting plural nodes so that an output of a node is input to another node in accordance with a predetermined coupling weight coefficient, comprising a loop feeding back an output of at least one node to at least one of said one node and a node other than said one node. (**Mehrotra,** p137, Figure 4.24; Mehrotra illustrates a total of five nodes, each with a feedback path to the other nodes and to itself.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Kamihira by giving the neural network feed back pathways as taught by Mehrotra to have a first recurrent neural network formed by connecting plural nodes so that an output of a node is input to another node in accordance with a predetermined coupling weight coefficient, comprising a loop feeding back an output of at least one node to at least one of said one node and a node other than said one node.

For the purpose of giving the neural network a way to train itself using loop feeding back pathways

Kamihira teaches an optimizing unit for determining an optimum solution of said coupling weight coefficient in said first recurrent neural network based on a learning rule using a hereditary algorithm (**Kamihira,** ¶0053 and ¶0074), wherein said first recurrent neural network outputs a first parameter indicating said motion state of the vehicle based on predetermined input information, thereby functioning as said vehicle motion model. (**Kamihira,** ¶0038; 'Vehicle motion' of applicant is equivalent to 'controlling a vehicle engine' of Kamihira.)

Claim 2.

Kamihira fails to particularly call for said first recurrent neural network has a

hierarchical structure comprising at least an input layer formed of one or more nodes

and an output layer formed of one or more nodes.

Mehrotra teaches said first recurrent neural network has a hierarchical structure

comprising at least an input layer formed of one or more nodes and an output layer

formed of one or more nodes. (**Mehrotra,** p137, Figure 4.24) It would have been

obvious to a person having ordinary skill in the art at the time of applicant's invention to

modify the teachings of Kamihira by having at least one input node and one output node

as taught by Mehrotra to have the said first recurrent neural network has a hierarchical

structure comprising at least an input layer formed of one or more nodes and an output

layer formed of one or more nodes.

For the purpose of establishing an input and output location for the neural

network.

Kamihira teaches said optimizing unit determines said optimum solution of said

coupling weight coefficient with connection of respective nodes between neighboring

layers being set as a processing target. (**Kamihira,** ¶0041; "Optimum solution' of

applicant is equivalent to 'customizes control parameters' of Kamihira.)

Claim 3.

Kamihira fails to particularly call for said first recurrent neural network is formed

of said plural nodes connected mutually so that said output of said one node is input to

all the plural nodes including said one node, and respective outputs of said plural nodes are input to said one node, and said optimizing unit.

Mehrotra teaches said first recurrent neural network is formed of said plural nodes connected mutually so that said output of said one node is input to all the plural nodes including said one node, and respective outputs of said plural nodes are input to said one node, and said optimizing unit. (**Mehrotra, p137,** Figure 4.24; Mehrotra illustrates that each node is connected to every other node and to itself.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Kamihira by defining the architecture of a recurrent neural network as taught by Mehrotra to have a first recurrent neural network is formed of said plural nodes connected mutually so that said output of said one node is input to all the plural nodes including said one node, and respective outputs of said plural nodes are input to said one node, and said optimizing unit.

For the purpose of taking advantage of a recurrent neural network properties

Kamihira teaches determines said optimum solution of said coupling weight coefficient with mutual connection of said plural nodes being set as a processing target. (**Kamihira,** ¶0040 and ¶0041; 'Optimum solution' and 'coupling weight coefficient' of applicant is equivalent to 'optimum control' and 'control parameters' of Kamihira.)

Claims 5, 7 and 9.

Kamihira fails to particularly call for a second recurrent neural network constructed as a network different from said first recurrent neural network.

Mehrotra teaches a second recurrent neural network constructed as a network different from said first recurrent neural network. (**Mehrotra,** p137, Figure 4.23(b); Mehrotra illustrates a recurrent neural network with three outputs.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Kamihira by utilizing a different design of a recurrent neural network as taught by Mehrotra to have a second recurrent neural network constructed as a network different from said first recurrent neural network.

For the purpose of fulfilling a different function than that of the first recurrent neural network.

Kamihira teaches functioning as the vehicle motion model by outputting a second parameter indicating a motion state of the vehicle different from said first parameter (**Kamihira,** ¶0040; Kamihira illustrates two outputs, 'fuel injector' and 'throttle value'.), wherein said optimizing unit further determines the optimum solution of said coupling weight coefficient in said second neural network based on said learning rule using said hereditary algorithm. (**Kamihira,** ¶0053 and ¶0074)

Claim Rejections - 35 USC § 103

6.   Claims 4, 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kamihira and Mehrotra, as set forth above, and further in view of Fujita, referred to as **Fujita.** (U. S. Patent Publication 20020158599)

        Claims 4, 6 and 8.

Kamihira and Mehrotra do not teach each of said plural nodes uses one of a sigmoid function and a non-sigmoid function other than said sigmoid function as a transfer function.

Fujita teaches each of said plural nodes uses one of a sigmoid function and a non-sigmoid function other than said sigmoid function as a transfer function. (**Fujita,** ¶0332; 'Non-sigmoid function' of applicant is equivalent to 'threshold function' of Fujita.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify combined teachings of Kamihira and Mehrotra by using both sigmoid and non-sigmoid functions as taught by Fujita to have each of said plural nodes uses one of a sigmoid function and a non-sigmoid function other than said sigmoid function as a transfer function.

For the purpose of using both types of functions better enables the model to replicate the vehicle motion model.

Claim Rejections - 35 USC § 103

7.   Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamihira, as set forth above, and further in view of Minowa, referred to as **Minowa.** (U. S. Patent 6397140), and Kimoto, referred to as **Kimoto** (U. S. Patent 5579442)

Claim 19.

Kamihira does not teach said first recurrent neural network and said second

recurrent neural network are mutually connected to each other so that a state variable

having a correlation with said first parameter output from said first recurrent neural

network is input to said second neural network, where said state variable represents

one of a road surface state and a motion state of the vehicle.

The combination of Kimoto and Minowa teach said first recurrent neural network

and said second recurrent neural network are mutually connected to each other so that

a state variable having a correlation with said first parameter output from said first

recurrent neural network is input to said second neural network (**Kimoto,** C16:26-38),

where said state variable represents one of a road surface state and a motion state of

the vehicle. (**Minowa,** C2:20-35 and C11:22-53) It would have been obvious to a person

having ordinary skill in the art at the time of applicant's invention to modify the teachings

of Kamihira by using the output of one neural network as an input to a second neural

network in reference to road surface conditions and speed as taught by the combination

of Kimoto and Minowa to have the said first recurrent neural network and said second

recurrent neural network are mutually connected to each other so that a state variable

having a correlation with said first parameter output from said first recurrent neural

network is input to said second neural network, where said state variable represents

one of a road surface state and a motion state of the vehicle.

For the purpose of taking into account the condition of the road surface when

determining the motion state.

Claim Rejections - 35 USC § 103

8.   Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the

combination of Kamihira and Mehrotra as set forth above, and further in view of

Minowa, referred to as **Minowa.** (U. S. Patent 6397140), and Kimoto, referred to as

Kimoto (U. S. Patent 5579442)

Claim 10.

Kamihira and Mehrotra do not teach said first recurrent neural network and said

second recurrent neural network are mutually connected to each other so that a state

variable having a correlation with said first parameter output from said first recurrent

neural network is input to said second neural network, where said state variable

represents a road surface state or a motion state of the vehicle.

The combination of Kimoto and Minowa teach said first recurrent neural network and

said second recurrent neural network are mutually connected to each other so that a

state variable having a correlation with said first parameter output from said first

recurrent neural network is input to said second neural network (**Kimoto,** C16:26-38),

where said state variable represents a road surface state or a motion state of the

vehicle. (**Minowa,** C2:20-35 and C11:22-53) It would have been obvious to a person

having ordinary skill in the art at the time of applicant's invention to modify combined

teachings of Kamihira and Mehrotra by by using the output of one neural network as an

input to a second neural network in reference to road surface conditions and speed as

taught by the combination of Kimoto and Minowa to have said first recurrent neural

network and said second recurrent neural network are mutually connected to each other

so that a state variable having a correlation with said first parameter output from said

first recurrent neural network is input to said second neural network, where said state

variable represents a road surface state or a motion state of the vehicle.

For the purpose of taking into account the condition of the road surface when

determining the motion state.

Conclusion

9.   The prior art of record and not relied upon is considered pertinent to the

applicant's disclosure.

-U. S. Patent Publication 20030015032: Glenney

-U. S. Patent Publication 20030005759: Breed

-U. S. Patent Publication 20020198655: Bevly

-U. S. Patent Publication 20010019088: Smith

-U. S. Patent 6466888: McCool

-U. S. Patent 6317658: Vian

-U. S. RE37,331 E :Schroeder

10.   Claims 1-19 are rejected.

Correspondence Information

11.   Any inquiry concerning this information or related to the subject disclosure should

be directed to the Examiner Peter Coughlan, whose telephone number is (571) 272-

5990. The Examiner can be reached on Monday through Friday from 7:15 a.m. to 3:45

p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's

supervisor David Vincent can be reached at (571) 272-3687. Any response to this

office action should be mailed to:

Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

Hand delivered to:

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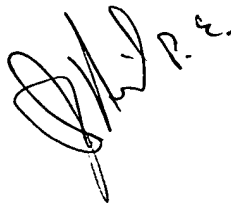401 Dulany Street,

Alexandria, Virginia 22313,

(located on the first floor of the south side of the Randolph Building);

or faxed to:

(571) 273-8300 (for formal communications intended for entry.)

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

unpublished applications is available through Private PAIR only. For more information

about the PAIR system, see http://pair-direct.uspto.gov. Should you have any questions

on access to Private PAIR system, contact the Electronic Business Center (EBC) at

866-217-9197 (toll free).

Peter Coughlan

4/5/2006